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| 10/024,037   | 12/21/2001  | Konstantinos E. Spartiotis | 2338/46007                     | 4682             |
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| KENYON & KENYON<br>1500 K STREET NW<br>SUITE 700<br>WASHINGTON, DC 20005 |             |                            | EXAMINER<br>SUCHECKI, KRYSZYNA |                  |
|  |             |                            | ART UNIT<br>2882               | PAPER NUMBER     |

DATE MAILED: 07/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/024,037

Applicant(s)

SPARTIOTIS ET AL.

Examiner

Krystyna Suchecki

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-37 and 41-51 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-37 and 41-51 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Objections*

1. Claims 5, 7 and 45 are objected to because of the following informalities: Claim 5 is objected to since “course” should read “source.” Claim 7 is objected to for misspelling “tomography.” Claim 45 is objected to since there is no antecedence for a “detector region” and further since there is no antecedence for a detector “call.” Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-4, 8-19, 23-28, 33-36 and 41-48 are rejected under 35 U.S.C. 102(e) as being anticipated by Danielsson (US 2002/0018543).

4. Regarding Claims 1 and 33, Danielsson teaches an imaging system and method for high energy radiation direct conversion scan imaging, comprising: a high energy radiation source member (502); a semiconductor high energy radiation direct conversion imaging device including a plurality of imaging cells (Paragraph 34, ‘856 patent), each imaging cell comprising a detector cell and a readout cell for producing imaging cell output values representative of high energy radiation incident on said detector cell (Figure 2a); said source member and/or said imaging device arranged to move substantially continuously relative to an object position for scanning an object at said object position (Figure 5, Paragraph 42); and wherein said readout

cells are arranged to readout said imaging cell output values at time intervals substantially corresponding to an object image point traversing half the distance or less of a detector region in the scanning direction during a scan (Paragraphs 48-50).

5. Regarding Claims 2 and 34, Danielsson teaches an imaging system and method, arranged to read out an image cell value from each of at least a subset of said plurality of imaging cells during each of said time intervals (Paragraphs 48-50).

6. Regarding Claims 3, 4, 8, 35 and 36, Danielsson teaches an imaging system and method, wherein said source member and/or said imaging device are moveable to image a part of an object in said object position from two or more positions, said source and/or said imaging device are arranged to rotatably move relative to said object position, and said source and/or said imaging device are arranged for linear movement relative to said object position (Figure 5 and Paragraph 42).

7. Regarding claims 6 and 7, Danielsson teaches a dental panoramic imaging system or dental computerised tomography imaging system comprising an imaging system according to claim 1. Danielsson teaches these since the preamble is given no patentable weight. The recitations are intended uses. The claim also lacks any structural limitation in the body of the claim.

8. Regarding Claims 9 and 10, Danielsson teaches an imaging system, wherein said source member comprises a support for a high energy radiation source and a high energy radiation source (Figure 5 and Paragraph 42).

9. Regarding Claims 11 and 12, Danielsson teaches an imaging system according to claim 9, wherein said high energy radiation source comprises a steerable beam high energy radiation

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source wherein said steerable beam high energy radiation source comprises an electrically steerable beam. The beam is steered by way of computer controlled collimators (Paragraphs 40-42).

10. Regarding Claims 13 and 41, Danielsson teaches an imaging system and method, wherein said high energy radiation source is operated to continuously radiate said high energy radiation during said scanning. Danielsson teaches this since the radiation source is activated and stays on until a complete scan is made (Paragraphs 45-51).

11. Regarding Claims 14, 15, 42 and 43, Danielsson teaches an imaging system and method, wherein said imaging device is arranged to readout said imaging cell output values at time intervals corresponding to an object image point traversing a part of said detector region or substantially corresponding to an object image point traversing half a detector region (Paragraphs 48-50).

12. Regarding Claims 16, 17 and 44, Danielsson teaches an imaging system and method, wherein said readout cell is arranged to readout said imaging cell output values during said traversing of said detector region and substantially continuously during said traversing of said detector region (Paragraphs 48-50). The “substantially continuously” limitation is taught since the reading are as “frequently as possible,” which can mean the read-out is as continuous as possible.

13. Regarding Claims 18 and 45, Danielsson teaches an imaging system and method, wherein said detector region comprises a detector cell (Paragraph 34, ‘856 patent).

14. Regarding Claim 19, Danielsson teaches an imaging system, wherein said readout cells are arranged to readout said imaging cell output values after said traversing (Paragraphs 48-51).

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15. Regarding Claims 23 and 46, Danielsson teaches an imaging system and method, wherein said imaging device is arranged to readout imaging cell output values for at least some of said plurality of imaging cells of said imaging device (Paragraphs 48-51).

16. Regarding Claims 24, 26 and 48, Danielsson teaches an imaging system and method, comprising a plurality of imaging devices, wherein two or more imaging devices are coupled together for reading out said imaging cell output values from more than one imaging device (Paragraph 35).

17. Regarding Claims 25 and 47, Danielsson teaches an imaging system and method, wherein each of said plurality of imaging devices are readout individually. Danielsson teaches this since each individual pixel on each imaging device is read out for its data value (Paragraph 48). Since each pixel must be read individually, each imaging device must be read individually to preserve the pixel values.

18. Regarding Claims 27 and 28, Danielsson teaches an imaging system, interfaceable to data acquisition and control apparatus (513) for receiving and storing imaging cell output values wherein said data acquisition and control apparatus comprises a personal computer (Paragraph 42).

***Claim Rejections - 35 USC § 103***

19. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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20. Claims 5 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Danielsson in view of Yanaki (US Re. 33,634).

21. Regarding Claims 5 and 37, Danielsson teaches an imaging system and method as above with a rotatably moveable source and imaging device used for mammography (Paragraph 42).

22. Danielsson fails to teach that said source member and/or said imaging device are rotatably moveable about a moveable axis of rotation.

23. Yanaki teaches that it is known in the mammography imaging art to change a source to object distance in order to increase the x-ray flux passing through the object (Column 3, lines 21-24). This distance change also shortens the imaging time and decreases blurring (Column 2, line 66- Column 3, line 21).

24. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to change the distance between the object and at least the source member in the system of Danielsson so as to increase the x-ray flux passing through the object to shorten the imaging time and decrease blurring (Yanaki, Column 2, line 66- Column 3, line 21). Such a change in distance would result in a moveable axis of rotation for at least the source member in the imaging device of Danielsson.

25. Claims 20-22, 31, 32 and 49-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Danielsson in view of Izumi (US 6,262,408) and Bluzer (US 4,636,980).

26. Regarding Claims 20-22 and 49-51, Danielsson teaches an imaging system above with readout cells arranged to readout imaging cell output values. The imaging cells are part of detector elements (Paragraphs 34 and 48-50).

27. Danielsson fails to specifically teach the readout of imaging cell output values at a rate of substantially 5MHz or 10MHZ or more or 20 MHz or more, nor does Danielsson teach readout of imaging cell output values at a frame rate of 60 frames/second, 100 frames/second or 200 frames/second. Danielsson is silent as to whether readout cells comprise integrated circuitry, whether the cells are “high speed” or how the cells are made.

28. Izumi teaches an integrated circuitry imaging cell comprising a detector cell and a readout cell (Column 5, lines 44-67). The imaging cell provides improved response time and can deal with dynamic images (Column 3, lines 40-42). The detector imaging cell allows acquisition of dynamic images at a rate of 33 msec/frame [303 frames per second] (Column 8, lines 31-38). The imaging cell includes readout cells comprising high speed integrated circuitry fabricated in accordance with one or more of the following technologies: Op to electronics (photolithography). However, the method of forming a device is not germane to the issue of patentability of the device itself. Therefore, this limitation has been treated for its contents but has not been given patentable weight.

29. Bluzer teaches an imaging device where in an integrated circuitry imaging cell provides readout at a rate substantially 5MHz, 10MHZ or 20MHZ or more (50MHz) and a readout of approximately 30 frames per second (Column 1, lines 30-52). Trade-offs are made between the frame/second and the Hz readout values based on post processing requirements for noise or speed (Column 1, lines 30-52). The device provides fine sensitivity, resolution and a dynamic range of the input radiation (Column 2, lines 44-52 and Column 6, lines 56-63).

30. Between Izumi and Bluzer, a range of readout values are established and used for particular results. The trade-offs between a particular frame/second and a particular Hz readout



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value determine whether the invention will lead to dynamic imaging of an object or a dynamic range of operation of the input radiation. It would have been obvious to one of ordinary skill in the art at the time the invention was made to balance the trade-offs between particular frame/second and Hz readouts of the imaging cell to have a system with a readout rate of substantially 5MHz, 10MHZ or 20MHZ or more or a frame rate of 60 frames/second, 100 frames/second or 200 frames/second in Danielsson, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. One would be motivated to find an optimum balance to have adequate response to changes in input radiation values, and also an adequate response to object motions during imaging. A higher frame/second would be required in a situation where, for instance, a contrast solution were being moved in the blood stream, which is a very dynamic imaging condition. A slower frame/second could be used for a contrast moving through the intestines. Based upon the needs, the correct frame/second readout would need to be selected. Likewise, the readout in Hz would be selected based on needs and goals. A particular Hz imaging cell could be selected based on post processing requirements for noise or speed. The resulting device would be a high speed integrated circuitry device formed in accordance with certain methods. Though the imaging cell of Bluzer is not expressly linked to an x-ray system, the cell of Bluzer is easily adapted for use in x-ray systems by the inclusion of a scintillation panel.

31. Claims 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Danielsson in view of Schick (US 6,134,298) and Everything USB.

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32. Regarding Claims 29 and 30, Danielsson teaches an imaging system with a personal computer as above.

33. Danielsson fails to teach an interface to a personal computer, notebook or laptop computer using either a USB or USB2 interface bus.

34. Schick teaches the use of USB interfaces in imaging systems (Abstract). The imaging device is adapted for use with a USB interface due to the prevalent use of USB ports, and the elimination or occupation of other ports on a computer (Column 2). The use of USB ports, and concurrent adaptation of devices to interface with a USB port, allows an imaging system user to purchase a computer without purchasing certain additional slots [without the need to upgrade components at the time of purchase] (Column 2). This saves the user money and space for the computer purchase.

35. Everything USB teaches that a USB2 is an adaptation and improvement to the USB interface. It is backwards compatible: it is able to function with USB devices and functions as a USB port, while also functioning as a higher bits/second device.

36. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use either the USB device of Schick, or the USB2 device of Everything USB, in the imaging system of Danielsson, since the use of a USB or USB2 port and device would allow Danielsson to having an imaging system with fewer computer upgrades required at the time of purchase. Danielsson could use either the USB or the USB2 devices as needed, though the USB2 would overcome certain deficiencies of Schick, such as by provided higher bits/second transmissions.

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*Response to Arguments*

37. Applicant's arguments, see response, filed 05/17/05, with respect to the rejection(s) of claim(s) 1-7, 9-19, 23-28, 33-39 and 41-48 under Hsieh (US 5,265,142) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Danielsson.

*Conclusion*

38. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Danielsson (US 2002/0017609) is of interest as it corresponds to SE 9900856-7, cited in Danielsson (US 2002/0018543) above for teachings related to Figure 2a.

39. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krystyna Suchecki whose telephone number is (571) 272-2495. The examiner can normally be reached on M-F, 9-5.

40. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

41. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Craig E. Church  
Primary Examiner